

**MSA** **Universal Pump  
Probe**  
**Operating Manual**



In North America, to contact your nearest stocking location, dial toll-free 1-800-MSA-2222  
To contact MSA International, dial 1-412-967-3354 or 1-800-MSA-7777

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Manufactured by  
**MSA INSTRUMENT DIVISION**  
P.O. Box 427, Pittsburgh, Pennsylvania 15230

(L) Rev 1

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## **⚠ WARNING**

**THIS MANUAL MUST BE CAREFULLY READ BY ALL INDIVIDUALS WHO HAVE OR WILL HAVE THE RESPONSIBILITY FOR USING OR SERVICING THE PRODUCT. Like any piece of complex equipment, this device will perform as designed only if it is used and serviced in accordance with the manufacturer's instructions. OTHERWISE, IT COULD FAIL TO PERFORM AS DESIGNED AND PERSONS WHO RELY ON THIS PRODUCT FOR THEIR SAFETY COULD SUSTAIN SEVERE PERSONAL INJURY OR DEATH.**

The warranties made by Mine Safety Appliances Company with respect to the product are voided if the product is not used and serviced in accordance with the instructions in this manual. Please protect yourself and others by following them. We encourage our customers to write or call regarding this equipment prior to use or for any additional information relative to use or service.

## **⚠ CAUTION**

For safety reasons, this equipment must be operated by qualified personnel only. Read and understand the instruction manual completely before operating

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# Chapter 1, Device Safety and Certifications

The Universal Pump Probe is for use by trained and qualified personnel.

## **⚠ WARNING**

- Read and follow all instructions carefully.
- Check pump for proper operation before each day's use.
- Do not place end of sampling line in liquids.
- Do not replace alkaline cells in a combustible atmosphere.
- Do not alter or modify device.

**INCORRECT USE CAN CAUSE SERIOUS PERSONAL INJURY OR DEATH.**

## Safety Limitations and Precautions

Carefully review the following safety limitations and precautions before placing this device in service:

- Perform the following check before each day's use to verify proper device operation:
  - Check pump for proper operation (see "Verifying Pump Operation" section). Have pump serviced if necessary.
- Keep the probe tip above liquid surfaces; otherwise, liquid may enter the system and block sample flow, causing internal damage.
- Replace alkaline cells in non-hazardous areas only. Dispose of batteries in accordance with local health and safety regulations.
- Do not alter this device or make any repairs beyond those specified in this manual. Only MSA-authorized personnel may repair this unit; otherwise, damage may result.

## Date of Device Manufacture

The date of manufacture for your Universal Pump Probe is coded into the device serial number.

- The last three digits represent the month (the letter) and the year (the two-digit number).
- The letter corresponds to the month starting with A for January, B for February, etc.

## Certifications

Tests completed by MSA verify that the Universal Pump Probe meets applicable industry and government standards as of the date of manufacture. Refer to device label to determine applicable approval.

## Device Usage

This device to be used on the Solaris Multigas Detector only.

## Device Specifications

**Table 1-1. Device Specifications**

TEMPERATURE RANGE	NORMAL	-20 to +50°C (-4 to +122°F)
SAMPLE LINE TRANSPORT TIMES	25 feet	10 seconds
	50 feet	20 seconds

## Electronic Interference

- This device generates, uses, and can radiate radio frequency energy. Operation of this device may cause interference, in which case, the user may be required to correct.
- This device is test equipment and is not subject to FCC technical regulations. However, it has been tested and found to comply with the limits for a Class A digital device specified in Part 15 of the FCC regulations.
- This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the CRTC.
- There is no guarantee that interference will not occur. If this device is determined to cause interference to radio or television reception, try the following corrective measures:
  - Reorient or relocate the receiving antenna
  - Increase separation between the device and the radio/TV receiver
  - Consult an experienced radio/TV technician for help.

## Chapter 2, Using the Universal Pump Probe

1. Press the POWER ON/OFF button.
  - The audible alarm sounds.
  - The pump motor starts fast and then slows down as the pump speed is automatically adjusted.
  - Once the pump is ready for use, the green LED flashes once per second.
2. Plug the free end of the sampling line or probe.
  - The pump motor shuts down.
  - The audible alarm sounds.
  - The red LED flashes.
3. When the pump inlet, sample line or probe is blocked, the pump alarm must activate. If the alarm does not activate:
  - Check the pump, sample line and probe for leaks
  - Once the leak is fixed, recheck the pump alarm by blocking the flow.
4. Check the pump before each day's use.

### **WARNING**

**Do not use the pump, sample line, or probe unless the pump alarm activates when the flow is blocked. Lack of an alarm is an indication that a sample may not be drawn to the sensors, which could cause inaccurate readings. Failure to follow the above can result in serious personal injury or death.**

**Never allow the end of the sampling line to touch or go under any liquid surface. If liquid is sucked into the device, readings will be inaccurate and the device could be damaged.**

5. Press POWER ON/OFF button to reset alarm and restart pump.

During operation, a pump alarm may occur when the:

- Flow system is blocked
- Pump is inoperative
- Sample lines are attached or removed
- Filters become clogged with excessive dirt or debris.

## To Clear an Alarm

1. Correct any flow blockage.
2. Press the POWER ON/OFF button to restart the Pump.

## Turning OFF the Universal Pump Probe

Press and hold the POWER ON/OFF button for three seconds.

- The red LED flashes once per second.
- The pump shuts down.
- The audible alarm sounds.

## Battery Warning

A Battery Warning indicates that a nominal 15 minutes of operation remain before device batteries are completely depleted.

**NOTE:** Duration of remaining Pump Probe operation during Battery Warning depends on:

- Ambient temperatures  
(The battery warning is likely to be shorter in colder temperatures).
- When the Pump Probe goes into Battery Warning:
  - Yellow and green LEDs alternately flash every other second.
  - The Pump continues to operate until the device is turned OFF or battery shutdown occurs.

## Battery Shutdown

When the batteries can no longer operate the device, the device goes into Battery Shutdown mode:

- Yellow LED flashes
- Audible alarm sounds
- Pump shuts down.

### **⚠ WARNING**

When Battery Shutdown condition occurs, stop using the device; it can no longer alert you of potential hazards since it does not have enough power to operate properly:

1. Leave the area immediately.
2. Turn OFF the device if it is ON.
3. Report to the person responsible for maintenance
4. Replace the batteries.

Failure to follow this procedure, could result in serious personal injury or death.

Replace batteries when the "Battery Low" or "Battery Shutdown" alarms occur. When replacing alkaline batteries, replace ALL batteries with fresh ones at the same time. Do not mix new and partially-discharged batteries. If the batteries are improperly replaced or improperly mixed, the "Battery Low" and "Battery Shutdown" alarms may fail to function, which could result in serious personal injury or death.

Do not use rechargeable batteries in Alkaline Battery Packs. The Alkaline battery warning and alarm setpoints are not optimized for rechargeable batteries. The low battery warning and alarm could occur too quickly to be noticed. Using rechargeable batteries in the Alkaline battery pack could result in serious personal injury or death.

### **⚠ CAUTION**

During "Battery Low" condition, prepare to exit the work area since the device could go into "Battery Shutdown" at any time, resulting in loss of pump operation. Depending on the age of the batteries, ambient temperature and other conditions, the device "Battery Low" and "Battery Shutdown" times could be shorter than anticipated.

## Chapter 3, Live Maintenance

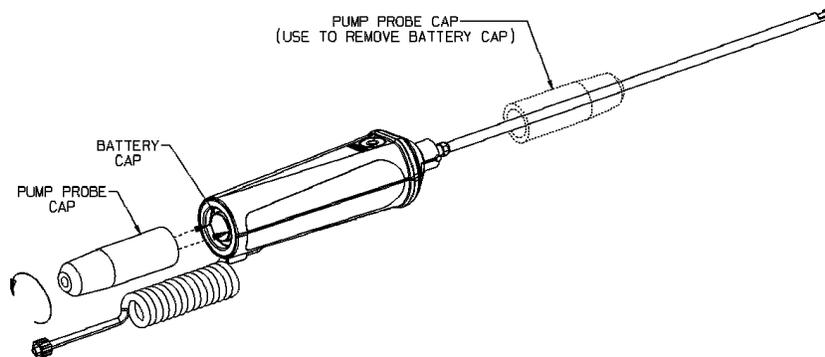
The Universal Pump Probe uses replaceable alkaline batteries. See TABLE 3-1 for approximate run times at various temperatures. In colder temperatures, battery output may be severely reduced.

**Table 3-1.**  
**Expected Device Run Times at Various Temperatures**

STORAGE AND OPERATING TEMPERATURE	RUN TIME
21°C (70°F)	22 hours
0°C (32°F)	7 hours
-20°C (-4 °F)	1.5 hours

### Installing the Battery Pack

1. Replace alkaline cells in non-hazardous areas only.
2. Remove the Pump Probe cap (FIGURE 3-1) from the pump probe assembly (P/N 10046527) by pushing the cap toward the body of the probe, twisting it to release it from the locked-in position, and pulling it away from the probe body.
3. Insert the end of the Pump Probe cap into the battery cap located at the bottom of the Pump Probe handle (FIGURE 3-1).



**Figure 3-1. Removing the Battery Pack**

4. Remove the battery cap by turning it counter-clockwise.
  5. Remove the alkaline battery pack by pulling the plastic tab attached to the battery board.
  6. Properly discard or recycle the discharged alkaline batteries and replace with two new, fresh batteries.
  7. Carefully insert the new batteries into the pump probe handle.
  8. Replace the battery cap.
  9. Re-attach the pump probe cap to the pump probe assembly.
  10. The pump probe is now ready to be used.
- See TABLE 3-2 for Alkaline batteries approved for use in the Universal Pump Probe.

**Table 3-2. Batteries Approved for use in the Universal Pump Probe**

BATTERY	UL/C-UL	EUROPE	AUSTRALIA
DURACELL MN1500	●	●	●
VARTA 4006	●	●	
Energizer E91	●	●	●

## Cleaning and Periodic Checks

As with all electronic equipment, the Universal Pump Probe will operate only if it is properly maintained.

### **⚠ WARNING**

Alteration of the Universal Pump Probe, beyond the procedures described in this manual or by anyone other than a person authorized by MSA, could cause the device to fail to perform properly. Use only genuine MSA replacement parts when performing any maintenance procedures described in this manual. Substitution of components can seriously impair device performance, alter intrinsic safety characteristics or void agency approvals.

**FAILURE TO FOLLOW THIS WARNING CAN RESULT IN SERIOUS PERSONAL INJURY OR DEATH.**

## Cleaning and Routine Care

Periodically clean the Universal Pump Probe case with a soft damp cloth.

## Checking The Pump Inlet Filter

The Universal Pump Probe contains a filtering system to protect the pump from particles and water in the sample air. If the filter becomes clogged, the sample flow may be blocked, or an extra load may be placed on the pump; therefore, check the filter regularly.

The frequency of checks should depend on amount of pump usage and concentration of particles allowed to enter the pump. In dirty applications, replace the dust filter every 200 hours.

## Replacing the Filters

### **⚠ CAUTION**

**When replacing external dust and water filters, prevent any dust or dirt around the filter housing from entering the pump housing. Dust or dirt in the pump unit may impede pump operation.**

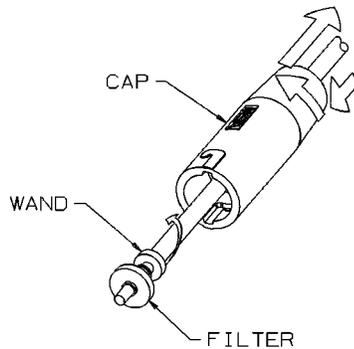
## Probe Filter

The MSA sampling probe contains a filter to:

- block dust and dirt
- block the passage of water.

If the probe tip is accidentally submerged in water, the filter prevents the water from reaching the internal pump. The filter is not designed to stop other liquids, such as gasoline or alcohols.

**To Replace the Probe Filter (FIGURE 3-2):**



**Figure 3-2. Replacing the Probe Filter**

1. Push the cap section toward the other two and turn clockwise.
  - The spring pushes the sections apart.
2. Grasp and spin the wand clockwise while pulling to disengage.
3. Remove the filter (P/N 636244) and replace.

### **Internal Dust Filter**

The Universal Pump Probe contains an internal filter. This filter forms a final barrier against any dust that enters the pump assembly when external filters are replaced. The filter is provided as a final safety precaution and should rarely, if ever, require replacement.

1. Turn OFF the power.
2. Remove the battery pack from the Universal Pump Probe.
3. Remove the two self-tapping screws from the Universal Pump Probe lens/diffuser.
4. Remove the filter and discard.
5. Install the new filter with flow arrow pointing toward the pump and drive inlet. Ensure that the tube from the pump outlet is routed to the inside of the filter.
6. Replace and secure the Universal Pump Probe lens/diffuser with

the two self-tapping screws.

**NOTE:** Be careful to properly install the lens gasket.

7. Re-install the batteries and battery cap.

## Storage

When not in use, store your Universal Pump Probe in a safe, dry place between -5° and 40°C (23° and 104°F).

## Shipment

1. Remove batteries before shipment. When returning the Universal Pump Probe for repairs, remove the battery pack from unit, and include it in the container.
2. Pack the Universal Pump Probe in its original shipping container with suitable padding. If the original container is unavailable, an equivalent container may be substituted. Seal Pump Probe in a plastic bag to protect it from moisture. Use sufficient padding to protect it from the rigors of handling. Damage due to improper packaging or damage in shipment is not covered by the device's warranty.

## Troubleshooting

The Universal Pump Probe will operate reliably for years when cared for and maintained properly. If the device becomes inoperative, you may return inoperative devices to MSA for repair.

- **MSA Instrument Division  
Repair and Service Department  
1000 Cranberry Woods Drive  
Cranberry Township, PA 16066-5207  
1-800-MSA-INST**

To contact MSA International, please call:

- **1-412-967-3000 or 1-800-MSA-7777**

# Chapter 4, Warranty

## MSA Portable Instrument Warranty

### 1. Warranty-

ITEM	WARRANTY PERIOD
Chassis and Electronics	Two years
Pump and Drive Unit	Two years

This warranty does not cover filters, fuses, etc. Certain other accessories not specifically listed here may have different warranty periods. This warranty is valid only if the product is maintained and used in accordance with Seller's instructions and/or recommendations. The Seller shall be released from all obligations under this warranty in the event repairs or modifications are made by persons other than its own or authorized service personnel or if the warranty claim results from physical abuse or misuse of the product. No agent, employee or representative of the Seller has any authority to bind the Seller to any affirmation, representation or warranty concerning this product. Seller makes no warranty concerning components or accessories not manufactured by the Seller, but will pass on to the Purchaser all warranties of manufacturers of such components. **THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED, IMPLIED OR STATUTORY, AND IS STRICTLY LIMITED TO THE TERMS HEREOF. SELLER SPECIFICALLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.**

2. **Exclusive Remedy-** It is expressly agreed that Purchaser's sole and exclusive remedy for breach of the above warranty, for any tortious conduct of Seller, or for any other cause of action, shall be the replacement at Seller's option, of any equipment or parts thereof, which after examination by Seller is proven to be defective. Replacement equipment and/or parts will be provided at no cost to Purchaser, F.O.B. Seller's Plant. Failure of Seller to successfully replace any nonconforming equipment or parts shall not cause the remedy established hereby to fail of its essential purpose.

3. **Exclusion of Consequential Damages-** Purchaser specifically understands and agrees that under no circumstances will seller be liable to purchaser for economic, special, incidental or consequential damages or losses of any kind whatsoever, including but not limited to, loss of anticipated profits and any other loss caused by reason of nonoperation of the goods. This exclusion is applicable to claims for breach of warranty, tortious conduct or any other cause of action against seller.

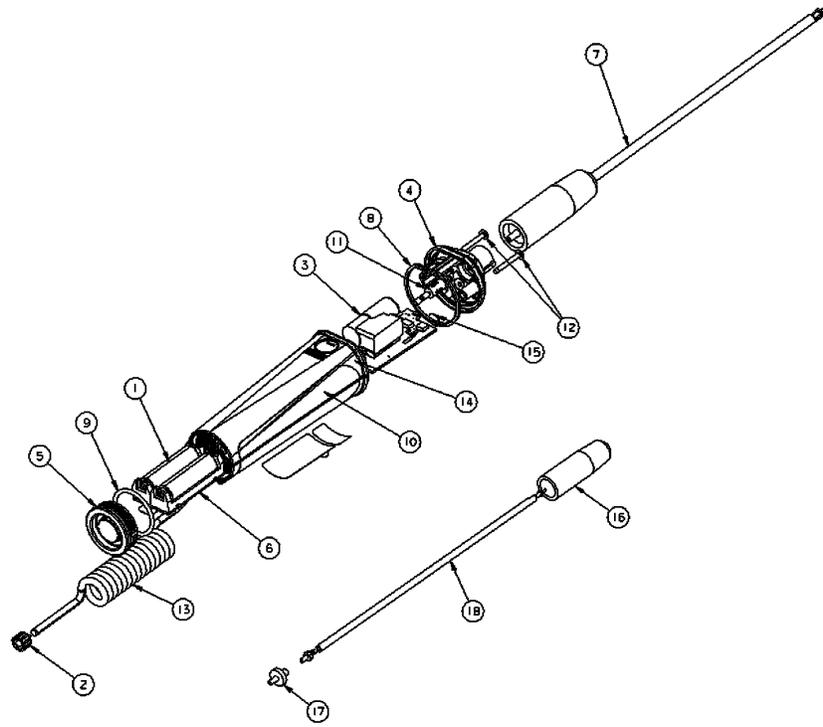
## Chapter 5, Replacement and Accessory Parts

**Table 5-1. Accessory Parts List**

<b>PART</b>	<b>PART NO.</b>
Replacement Filter, Probe (pkg. of 10)	801582
50-Foot Sample Line	10047349
25-Foot Sample Line	10047370

**Table 5-2. Replacement Parts List**

<b>FIGURE 5-1 ITEM</b>	<b>PART</b>	<b>PART NO.</b>
1	Battery, 1.5-volt, AA Alkaline	632466
2	Fitting, Quick Disconnect	635833
3	Pump and Drive	10037710
4	Diffuser	10046141
5	Battery Cap	10046142
6	Battery Printed Circuit Board Assembly	10046166
7	Probe Assembly	10046527
8	Gasket Diffuser, Molded	10046145
9	O-ring, 1-1/4 ID x 1-7/46 OD x 3/32 T	10046612
10	Handle Assembly	10047345
11	Suction Line Filter Assembly	10047371
12	Screw, #6 x 1" Tapping, 410 Stainless	10047391
13	Tubing, Coiled, Polyurethane, Black, 3 Foot Long	10047468
14	Pump Probe Printed Circuit Board Assembly	10045007
15	Speaker Felt, Hydrophobic	10051473
16	Cap Assembly, Probe, Spring and O-ring	497499
17	Filter	636244
18	Wand Assembly	10047469



**Figure 5-1. Replacement Parts (See Table 5-1)**